RIVERS AND FLOODS

[River and Flood Division, MONTROSE W. HAYES in charge]

By W. J. MOXOM

Flood producing rains, ranging in amount from 6 to 9 inches, fell on the night of June 30–July 1 in Texas in the central portions of the Colorado and Guadalupe Basins, and over the northern tributaries of the Neuces River. The flood in the Guadalupe River was severe, and was prolonged by continued rains. Crest stages below Gonzales, Tex., were the highest of record. The estimated losses were very large, amounting to approximately $2,130,000, of which nearly $1,500,000 was to matured and prospective crops. About 20 persons were drowned in the rapidly-rising creeks tributary to the main stream. Nine members of two families were lost in Plum Creek in Hays and Caldwell Counties. A freight train on the Missouri Pacific Railroad was wrecked in a creek near Kyle, Tex., resulting in the loss of two lives. The flood in the Colorado River was of short duration. The losses were not great; they were estimated at $37,000. In the Nueces River the rise was of moderate intensity, with crests 3 to 4 feet above flood stage, but the losses were considerable; they aggregated slightly more than $250,000, most of which was to matured and prospective crops.

Heavy wind and rainstorms in the Salt River Valley in Arizona on July 24, 25, and 26 caused rather severe local inundations on several creeks, with total losses estimated at $30,000. Two lives were lost.

Flood stages were exceeded at Fort Sumner, N. Mex., on the Pecos River; at Brownsville, Tex., on the Rio Grande, and at Fayetteville, Tenn., on the Elk River. The losses from these overflows were small.

Falling stages prevailed throughout most of the Mississippi System, and the lowest July stages of record occurred at many stations. In the Willamette and Columbia Basins the monthly mean stage was below the average at all gaging stations.

Table of flood stages during July 1936

[All dates in July, unless otherwise specified]

River and station	Flood stage	Above flood stages—dates		Crest	
		From—	To—	Stage	Date
MISSISSIPPI SYSTEM					
Ohio Basin					
	Feet			*Feet*	
Elk: Fayetteville, Tenn	14	4	5	22.3	4
Arkansas Basin					
Purgatoire: Higbee, Colo	4	30	30	4.0	30
WEST GULF OF MEXICO DRAINAGE					
Colorado:					
Columbus, Tex	24	2	3	31.7	3
Wharton, Tex	26	3	4	32.9	4
Guadalupe:					
Gonzales, Tex	20	1	5	38.2	1
Victoria, Tex	21	1	9	30.7	4
		20	21	22.8	20
Nueces:					
Cotulla, Tex	15	5	9	19.2	7
Three Rivers, Tex	37	2	4	40.0	3
Pecos: Fort Sumner, N. Mex	5	12	12	8.0	12
Rio Grande: Brownsville, Tex	18	3	4	18.8	3
		17	18	19.3	17

WEATHER ON THE ATLANTIC AND PACIFIC OCEANS

[The Marine Division, I. R. TANNEHILL in charge]

NORTH ATLANTIC OCEAN, JULY 1936

By H. C. HUNTER

Atmospheric pressure.—Barometric pressure averaged less than normal during July over most of the North Atlantic Ocean and the adjacent shores. However, the southeast portion had somewhat greater average pressure than normal, the readings being notably high there from about the 6th to 16th, and again at the end of the month.

The highest pressure thus far reported was 30.64 inches, recorded during the forenoon of the 29th, near 44° N., 25° W., on the Dutch motor-tanker *Rotterdam*. The lowest pressure was 28.94 inches, on the British steamship *Badjestan*, about 2 p. m. the 2d, in approximately 56° N., 27° W.

TABLE 1.—*Averages, departures, and extremes of atmospheric pressure (sea level) at selected stations for the North Atlantic Ocean and its shores, July 1936*

Station	Average pressure	Departure	Highest	Date	Lowest	Date
	Inches	*Inch*	*Inches*		*Inches*	
Julianehaab, Greenland	29.84	+0.04	30.10	15, 16	29.50	3
Reykjavik, Iceland	29.81	−.03	30.15	29	29.38	6
Lerwick, Shetland Islands	29.72	−.08	30.03	28	29.26	15
Valencia, Ireland	29.81	−.17	30.39	30	29.26	23
Lisbon, Portugal	30.13	+.11	30.27	9, 31	29.83	22
Madeira	30.13	+.08	30.27	6	30.03	16, 21, 22, 26
Horta, Azores	30.31	+.04	30.56	29, 30, 31	30.06	25
Belle Isle, Newfoundland	29.77	−.12	30.16	24	29.30	1
Halifax, Nova Scotia	29.87	−.08	30.18	22	29.48	15
Nantucket	29.87	−.11	30.30	31	29.53	14
Hatteras	29.94	−.07	30.23	31	29.69	19
Bermuda	30.13	−.05	30.28	4	29.93	27, 28
Turks Island	30.04	−.03	30.08	1, 4, 17, 27	29.97	7, 24
Key West	30.01	−.02	30.12	4	29.79	29
New Orleans	30.00	.00	30.21	6	29.74	27

NOTE.—All data based on a. m. observations only, with departures compiled from

Cyclones and gales.—Winds attained gale force on various dates over different parts of the ocean. About 300 miles south-southeast of Cape Race, during the forenoon of the 1st, the American liner *President Roosevelt* met a small-area storm of marked intensity, the wind reaching force 11, the only reported instance of force so great over the North Atlantic during the month. This storm formed the southern portion of a vast LOW, which advanced to eastward, with the result that other vessels, especially some near or to northward of the 50th parallel, had fresh to strong gales near midocean on the 1st or the 2d.

About the middle of the month several vessels met fresh to strong gales along or near the eastern half of the steamship lanes as far as the English Channel; while from the 17th to 20th, gales of similar force were encountered from the waters off the Carolinas to the southern shore of Newfoundland.

Strong trade winds.—During the first week unusually strong trades were noted by a few vessels in the Caribbean Sea and in the general region of the Bahamas. The British motorship *Nairnbank*, when near the Windward Passage on the 3d, encountered a whole gale (force 10), which is seldom experienced in such waters save in connection with a tropical disturbance. Near the Canary Islands the northeast trades were decidedly strong from the 9th to 12th. In Puerto Rican waters the trade winds were stronger than usual on the 21st; and over parts of the northern Caribbean Sea just before the month ended.

Tropical disturbances.—Elsewhere in this issue will be found the description of two tropical storms, one of which affected the Bahamas, Florida, and adjacent waters dur-

gale force nor low readings of barometer at sea did this storm equal the extratropical storm over northerly waters during the first days of July. Chart IX presents the situation on the 27th, when the tropical storm was near the central Bahamas. There was a minor disturbance just north of the Mona Passage on the 22d, but it does not appear to have advanced or to have caused more than a brief period of winds of gale force.

Waterspout.—Early on the afternoon of the 20th a waterspout was noted in upper New York Harbor, starting not far off shore from Stapleton, Staten Island. For a few minutes it seemed to remain practically stationary, then moved slowly toward the northeast. After about 10 minutes it disappeared very suddenly. The height was estimated as more than 1,500 feet by officers of the Coast Guard.

Fog.—July 1936, was marked by about the same amount of fog as the preceding month of June, except for an increase in prevalence within a strip, between 45° and 50° north latitude, from Newfoundland eastward to a little beyond midocean.

Over the middle and western parts of the Grand Banks there was more than the normal July amount of fog. The region of greatest frequency, however, was in the square from 40° to 45° N., 65° to 70° W., which is adjacent to eastern New England and southern Nova Scotia. Here the reports indicate 19 days of fog.

From the vicinity of Nantucket southwestward to Chesapeake Bay there was less fog than normally occurs in July, there being scarcely any after the middle of the month.

Thick weather, due probably to dust from the African mainland, was reported south of the Canary Islands on the 9th.

On July 12 the steamships *Yarmouth* and *Losmar* collided in Boston Harbor during a fog, with considerable damage to each.

OCEAN GALES AND STORMS, JULY 1936

Vessel	Voyage		Position at time of lowest barometer		Gale began July	Time of lowest barometer July	Gale ended July	Lowest barometer	Direction of wind when gale began	Direction and force of wind at time of lowest barometer	Direction of wind when gale ended	Direction and highest force of wind	Shifts of wind near time of lowest barometer
	From—	To—	Latitude	Longitude									
NORTH ATLANTIC OCEAN			° ′	° ′				*Inches*					
Pres. Roosevelt, Am. S. S.	Cobh	New York	41 50 N.	51 04 W.	1	9a, 1	1	29.17	S.	W, 11	N.	W, 11	S-W-N.
Quaker City, Am. S. S.	Liverpool	Boston	50 20 N.	37 00 W.	2	8p, 1	3	29.17	S.	S, 7	WNW.	WSW, 9	S-WNW.
Tetela, Br. S. S.	Port Antonio	Liverpool	46 37 N.	34 20 W.	1	10p, 1	2	29.69	W.	SSW, 8	WNW.	SSW, 8	SSW-WNW.
Veendam, Du. S. S.	Rotterdam	New York	48 37 N.	35 34 W.	1	11p, 1	3	29.22	SSW.	SSW, 8	NNW.	SSW, 8	SSE-SSW-WNW.
Nairnbank, Br. M. S.	Colon	do	12 57 N.	77 54 W.	1	2a, 2	4	29.84	E.	E, 8	E.	E, 10	Steady.
Helmstrath, Br. S. S.	Swansea	Montreal	53 02 N.	45 30 W.	1	4a, 2	2	[1] 29.00	SW.	SW, 4	N.	N, 8	SW-N.
Badjestan, Br. S. S.	Newcastle	Sydney	56 18 N.	27 25 W.	3	2p, 2	4	28.94	NW.	SW, 6	WNW.	WNW, 8	SE-SW-W.
Sanyo Maru, Jap. M. S.	Cristobal	New York	10 36 N.	79 14 W.	5	7a, 5	6	29.74	ENE.	NE, 5	ENE.	ENE, 7	
Margaret, Am. S. S.	Jacksonville	San Juan	23 10 N.	69 10 W.	6	1a, 7	7	30.01	S.	S, 8	SE.	SE, 8	6 points to right.
Nishmaha, Am. S. S.	Hull	Port Tampa	46 33 N.	14 06 W.	8	10a, 8	8	29.38	W.	WNW, 8	NW.	NW, 8	WSW-NNW.
Roslin Castle, Br. M. S.	Las Palmas	Southampton	29 30 N.	13 00 W.	11	4a, 11	12	29.97	NE.	NE, 8	NNE.	NE, 9	
Tampa, Am. M. S.	Gibraltar	New York	42 04 N.	31 27 W.	15	Noon, 15	16	29.86	W.	W, —	NW.	W, 8	SW-W.
Lossiebank, Br. M. S.	Cape Town	Boston	39 12 N.	67 30 W.	15	7p, 15	15	29.78	WSW.	WSW, 8	WSW.	WNW, 8	
Exermont, Am. S. S.	Lisbon	New York	[2] 41 34 N.	20 00 W.	16	4a, 16	16	29.78	SSW.	W, 5	NW.	W, 8	SSW-W.
Belgian Gulf, Belg. M. S.	Flushing	Port Arthur	46 10 N.	17 52 W.	16	5p, 16	17	29.49	WSW.	WSW, 4	NNW.	NNW, 9	SSW-WSW-NNW.
Seatrain New York, Am. S. S.	New York	New Orleans	32 18 N.	75 42 W.	17	7a, 17	17	29.97	SW.	SW, 5	W.	W, 8	SW-W.
West Harshaw, Am. S. S.	Avonmouth	do	49 16 N.	12 20 W.	17	10a, 17	17	29.30	NW.	NW, 2	NW.	NW, 9	SE-NW.
Laurent Meeus, Belg. M. S.	Houston	Amsterdam	[2] 40 17 N.	56 37 W.	19	10a, 19	19	29.46	S.	SW, —	SW.	SW, 9	S-SW.
Tampa, Am. M. S.	Gibraltar	New York	42 45 N.	56 55 W.	20	8p, 20	20	29.68	SSE.	SSE, 9	SW.	SSE, 9	SSE-SW.
Geo. H. Jones, Am. S. S.	Baltimore	Guiria	19 00 N.	63 49 W.	21	4p, 21	22	29.93	ENE.	ENE, 7	ESE.	ENE, 7	
Yselhaven, Du. S. S.	Antwerp	Norfolk	49 55 N.	9 25 W.	22	8a, 23	24	29.49	SW.	WSW, 8	W.	W, 9	SSW-W.
Exermont, Am. S. S.	Lisbon	New York	40 38 N.	67 13 W.	25	8a, 26	25	29.69	S.	W, 2	S.	SSW, 8	
Helmstrath, Br. S. S.	Quebec	London	53 30 N.	26 39 W.	26	Noon, 26	27	[1] 29.60	SW.	WNW, 7	NW.	NW, 8	WSW-WNW.
Tillie Lykes, Am. S. S.	Galveston	Port au Prince	[3] 22 58 N.	79 04 W.	28	4a, 28	28	29.89	S.	W, 3	SE.	S, 6	W-S.
Yaka, Am. S. S.	Antwerp	Tampa	26 00 N.	76 50 W.	27	7a, 28	29	29.88	SE.	SE, 6	SSE.	S, 9	
Turrialba, Am. S. S.	Boston	Havana	26 20 N.	79 19 W.	28	6p, 28	29	29.75	ENE.	ESE, 9	SSW.	ESE, 9	
City of Omaha, Am. S. S.	Hamburg	Tampa	25 00 N.	80 10 W.	28	7p, 28	30	29.61	NE.	NW, 10	S.	NW, 10	N-WNW.
Atenas, Am. S. S.	Tela	Charleston	25 21 N.	80 00 W.	28	7p, 28	28	29.38	NNW.	SE, 8	SSE.	SE, 8	NNW-SSE.
Tillie Lykes, Am. S. S.	Port au Prince	Ciudad Trujillo	17 34 N.	72 20 W.	31	4p, 31	[2] 1	29.89	E.	ESE, 6	NE.	ESE, 6	E-ESE-E.
NORTH PACIFIC OCEAN													
Washington, Am. S. S.	Longview	Shanghai	[3] 51 59 N.	153 02 W.	5	2a, 6	6	29.93	SW.	WSW, 8	W.	SSW, 9	SSW-WSW.
Barentsz, Du. S. S.			16 31 N.	123 47 E.	8	10a, 8	8	28.65	N.	W, 6	SW.	NW, 12	NNW-W-S
Maunalei, Am. S. S.	Mahukona	San Francisco	37 30 N.	123 42 W.	13	2p, 14	14	29.87	NW.	NNW, 7	NNW.	NW, 8	
Washington, Am. S. S.	Longview	Shanghai	47 15 N.	158 45 E.	15	2p, 15	15	29.71	S.	SSW, 8	W.	SW, 8	S-WSW.
Pres. Jefferson, Am. S. S.	Yokohama	Victoria, B. C.	[3] 48 08 N.	174 57 E.	19	Mdt, 18	18	29.84	SE.	E, 5	SE.	SE, 8	
Silveryew, Br. M. S.	Los Angeles	Manila	15 00 N.	131 25 E.	18	4a, 19	19	29.64	E.	SE, 8	SW.	SE, 8	SE-S-SW.
Laganbank, Br. M. S.	San Francisco	do	15 54 N.	128 16 E.	19	8a, 19	19	29.62	SW.	SW, 5	SW.	SW, 8	ESE-Var-SW.

[1] Barometer uncorrected. [2] August. [3] Position approximate.

NORTH PACIFIC OCEAN, JULY 1936

By WILLIS E. HURD

Atmospheric pressure.—The distinctive feature of the pressure situation over the North Pacific Ocean during July 1936 was the great extent of the oceanic HIGH from the northwestern coast of the United States southwestward to a considerable distance beyond Midway Island, and from the Hawaiian Islands to the sixtieth parallel in the southeastern part of the Bering Sea. The pressure departure from normal at Dutch Harbor was +0.15, and at St. Paul, +0.22, as shown in table 1. Except in the Aleutian region, barometers over the high-pressure area were not far from normal.

Over the extreme southeastern part of the ocean, pressures below normal occurred, the departure being —0.12 at Juneau. Pressures were slightly below normal along the American coast to the southward.

In Asiatic waters, from northern Japan southwestward, average barometric readings were below 29.80 inches